

**REMARKS**

Claims 3-10 are pending in this application. By this Amendment, claims 3 and 6-9 are amended; and claims 1, 2, 11 and 12 are canceled. Claims 3, 6 and 8 are amended to further distinguish over the references cited in the Office Action. Claims 6, 7 and 9 are amended to overcome a claim rejection under 35 U.S.C. §112, second paragraph.

No new matter is added to the application by this Amendment. Support for the language added to claims 3, 6 and 8 can be found within claims 1 and 2 as originally filed.

Reconsideration of the application is respectfully requested.

**I. Rejection Under 35 U.S.C. §112**

Claims 6, 7, 9 and 12 were rejected under 35 U.S.C. §112, second paragraph, for allegedly being indefinite. This rejection is respectfully traversed.

Claim 12 is canceled by the present amendment. Therefore, the rejection is moot with respect to this claim. Claim 6 has been amended to replace the phrase "and/or" with the phrase "or;" claim 7 has been amended to remove the phrase "or the like;" and claim 9 has been amended to remove the phrase "or by a cooling mechanism."

Thus, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. §112, second paragraph.

**II. Rejection Under 35 U.S.C. §103(a)**

Claims 1-12 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Applicants' admitted prior art (AAPA) as set forth in page 1 of the specification in view of JP 2000-104130 (JP '130). The rejection is respectfully traversed.

Neither AAPA nor JP '130, taken singly or in combination, teaches or suggests a method of manufacturing a gas turbine part wherein the angle of the solid-liquid interface with respect to the plane perpendicular to the traveling direction of the solid-liquid interface is controlled by cooling both sides of the sheet metal (claim 3) or the sheet cast member

(claim 8), in a different degree of cooling, respectively, so that the solid-liquid interface is oblique with respect to the plane perpendicular to the traveling direction as recited in claims 3 and 8. Further, neither AAPA nor JP '130, taken singly or in combination, teaches or suggests a method of manufacturing a gas turbine part wherein the angle of the solid-liquid interface with respect to the plane perpendicular to the traveling direction of the solid-liquid interface is controlled by obliquely drawing out the sheet member with respect to the heater or the high frequency coil, so that the solid-liquid interface is oblique with respect to the plane perpendicular to the traveling direction as required by claim 6.

First, the applied references merely disclose conventional methods for producing a porous metal. The porous metals in the applied references fail to exhibit the advantageous effects exhibited by the gas turbine parts manufactured by the methods of claims 3, 6 and 8 as set forth from line 8 of page 7 to line 1 of page 8 in the present application. More specifically, the porous metals in the applied references do not provide for a complex shape such as a panel having oblique pores to be manufactured only by the simple casting and forming processes by controlling the angle of the solid-liquid interface in solidification with respect to the plane perpendicular to the traveling direction of the solid-liquid interface, which is the determination factor of the pore growing direction. Further, the porous metals in the applied references do not provide the desired cooling performance and the desired heat insulating performance that can be realized by controlling the pore diameter and the porosity by controlling the atmospheric gas pressure and the solidifying speed.

Still further, the porous metals in the applied references do not provide for a method of manufacturing gas turbine parts that can greatly simplify processing steps and can easily process a part at a low cost as realized by the methods of claims 3, 6 and 8. Moreover, the porous metals in the applied references do not provide for effusion cooling panels having

vertical or oblique pores that can be manufactured at a low cost using simple processing by controlling the solid-liquid interface according to the methods defined in claims 3, 6 and 8.

Second, AAPA merely discloses that some heat shield panels used in a combustor liner of a gas turbine employ a transpiration cooling structure in which complex cooling pores must be machined and parts must be joined to each other by a complex manner. Further, AAPA discloses that since panels having this structure require complex machining and the parts thereof must be divided, a manufacturing process of the panel is complex and the cost thereof is expensive (see page 1 of present application).

Third, JP '130 teaches that formation of a pore in a porous metal and the direction, size, porosity, etc., of the pore can be controlled by parameters, such as melting temperature, a solution gas pressure, coagulation gas pressure, cooling temperature, a coagulation cooling rate, a mixed volume ratio, and a pressure with inert gas (see paragraph [0019] of JP '130). However, claims 3 and 8 require generating pores by controlling the angle of the solid-liquid interface which is controlled by cooling both sides of the sheet metal in a different degree of cooling, so that the solid-liquid interface is oblique with respect to the plane perpendicular to the traveling direction. Claim 6 requires generating pores by controlling the angle of the solid-liquid interface which is controlled by obliquely drawing out the sheet member with respect to the heater or the high frequency coil, so that the solid-liquid interface is oblique with respect to the plane perpendicular to the traveling direction. Applicants submit that controlling pore generation by controlling the angle of the solid-liquid interface parameter is outside the scope of parameters taught or suggested by JP '130.

Thus, nowhere does AAPA or JP '130, taken singly or in combination, teach or suggest that the angle of the solid-liquid interface with respect to the plane perpendicular to the traveling direction of the solid-liquid interface is controlled by cooling both sides of the sheet metal (claim 3) or the sheet cast member (claim 8), in a different degree of cooling,

respectively, so that the solid-liquid interface is oblique with respect to the plane perpendicular to the traveling direction as recited in claims 3 and 8. Moreover, nowhere does AAPA or JP '130, taken singly or in combination, teach or suggest the angle of the solid-liquid interface with respect to the plane perpendicular to the traveling direction of the solid-liquid interface is controlled by obliquely drawing out the sheet member with respect to the heater or the high frequency coil, so that the solid-liquid interface is oblique with respect to the plane perpendicular to the traveling direction as required by claim 6.

Because the above-identified features of independent claims 3, 6 and 8 are not taught or suggested by AAPA and JP '130, taken singly or in combination, AAPA and JP '130 would not have rendered the features of claims 3, 6 and 8 obvious to one of ordinary skill in the art.

For at least these reasons, claims 3-10 are patentable over the applied references. Thus, withdrawal of the rejection under 35 U.S.C. §103(a) is respectfully requested.

### **III. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 3-10 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff  
Registration No. 27,075

Brian C. Anscomb  
Registration No. 48,641

JAO:BCA/hs

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**OLIFF & BERRIDGE, PLC**  
**P.O. Box 19928**  
**Alexandria, Virginia 22320**  
**Telephone: (703) 836-6400**

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